REMARKS

Claims 1-26, 30-33, and 39-72 are canceled and new claims 73-95 are added. As a result, Claims 27-29, 34-38 and 73-95 are pending.

Rejection of Claims 27-29 and 34-38 under 35 USC 103(a)

The Examiner rejects Claims 27-29 and 34-38 as being obvious in view of U.S. Patent 4,652,290 (Cho) combined with U.S. Patent 6,127,277 (DeOrnellas).

Independent Claim 27 is directed to a method of forming an optical component. The method is amended to include "obtaining a wafer having a light transmitting medium positioned over a base ... and applying an etching medium to the wafer so as to define one or more waveguides in the light transmitting medium. Independent claim 27 specifies that "the wafer ha(s) one or more dimensions with a length greater than 6 inches."

A prima facie case of obviousness is not established unless, "there (is) some suggestion or motivation ... to modify the references or combine reference teachings." See MPEP 706.02(j). The title of Cho shows that Cho is directed to "Making Channel Waveguides." In contrast, DeOrnellas is directed to etching of integrated circuits (ICs). See column 1, lines 45-53. Wong does not teach or suggest that the disclosed technology is suitable for use with optical components. As a result, the cited references provide no "suggestion or motivation" for combining them and the prima facie case of obviousness is not established.

Further, a prima facie case of obviousness is not established unless "there (is) a reasonable expectation of success" when combining references. See MPEP 706.02(j). Because light signals scatter when incident on rough surfaces, waveguide surfaces have stringent smoothness requirements. These smoothness requirements are also associated with stringent uniformity requirements. The smoothness and uniformity requirements associated with waveguide fabrication exceed the smoothness and uniformity requirements associated with integrated circuit fabrication. For instance, waveguide smoothness requirements are often one or more orders of magnitude higher than IC smoothness requirements. Further, uniformity requirements for waveguide fabrication are generally within +/-3% while the uniformity

requirements for IC fabrication are about +/-5%. As a result, there is an expectation that IC etches will not be successful when applied to waveguide fabrication.

The smoothness and uniformity requirements associated with waveguide fabrication become more difficult to meet as wafer size increases. Accordingly, the Claim 27 requirement that "the wafer ha(ve) one or more dimensions with a length greater than 6 inches" enhances the negative expectation of success associated with using IC etches to fabricate waveguides. y

CONCLUSION

In light of the Amendments and arguments set forth above, Applicants believe they are entitled to a letters patent. The Examiner is encouraged to telephone the undersigned with any questions.

Respectfully submitted

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VERSION WITH MARKINGS SHOWING CHANGES MADE

In the claims

1.-26. Canceled

27. (Amended) A method of forming an optical component, comprising:

obtaining a wafer having a light transmitting medium positioned over a base, the wafer having one or more dimensions with a length greater than 6 inches; and

applying an etching medium to the wafer so as to [form one or more surfaces in the light transmitting medium, the one or more surfaces including a surface of an optical component] define one or more waveguides in the light transmitting medium.

28. (Amended) The method of claim 27, wherein the wafer has one or more dimensions with a length of at least [8] 7 inches.

29. (Amended) The method of claim 27, wherein the wafer has one or more dimensions with a length of at least [10] 8 inches.

30.-33. Canceled.

34. (Unchanged) The method of claim 27, wherein the etching medium is applied continuously during formation of the one or more surfaces.

35. (Unchanged) The method of claim 27, wherein applying the etching medium excludes applying the etching medium in consecutively repeated cycles.

36. (Unchanged) The method of claim 27, wherein the light transmitting medium is silicon.

37. (Unchanged) The method of claim 27, wherein the etching medium includes an etchant and the etching medium is applied such that the etchant has a uniformity of 20% or less across the surface of the wafer.

38. (Unchanged) The method of claim 27, wherein the etching medium includes an etchant and the etching medium is applied such that the etchant has a uniformity of 10% or less across the surface of the wafer.

39.-72. Canceled.

73. (Added) The method of claim 27, wherein the etching medium includes a fluorine containing gas.

74. (Added) The method of claim 73, wherein the fluorine containing gas is selected from a group consisting of SF_6, CF_4, Si_2F_6 and NF_3.

75. (Added) The method of claim 73, wherein the fluorine containing gas includes SF_6.

76. (Added) The method of claim 73, wherein the etching medium includes a second fluorine containing gas selected from the group consisting of SiF_4 and SiF_6.

77. (Added) The method of claim 27, wherein the etching medium includes one or more partial passivants.

78. (Added) The method of claim 77, wherein the partial passivant is selected from a group consisting of HBr, SiF_4, C_4F_8, CH_2F_2 and CHF_3.

79. (Added) The method of claim 77, wherein the one or more partial passivants include CHF_3.

80. (Added) The method of claim 77, wherein the one or more partial passivants include C_4F_8.

81. (Added) The method of claim 27, wherein the etching medium is applied at a pressure of 1 mTorr to 600 mTorr.

82. (Added) The method of claim 27, wherein the etching medium is applied at a pressure of 1 mTorr to 60 mTorr.

83. (Added) The method of claim 27, wherein the etching medium is applied at a pressure of 10 mTorr to 30 mTorr.

84. (Added) The method of claim 27, wherein the etching medium includes a fluorine containing gas and a partial passivant.

85. (Added) The method of claim 84, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of 0.1:1 to 100:1.

86. (Added) The method of claim 84, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of .5:1 to 10:1.

87. (Added) The method of claim 84, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of 1:1 to 2:1.

88. (Added) The method of claim 84, wherein the etching medium includes one or more other media in addition to the partial passivant and the fluorine containing gas.

89. (Added) The method of claim 88, wherein the one or more other media is selected from the group consisting of SiF_4 and SiF_6

90. (Added) The method of claim 88, wherein the one or more other media include a noble gas.

91. (Added) The method of claim 27, further comprising:

forming a mask on the optical component before applying the etching medium, the mask formed on the optical component so as to protect regions of the optical component where the one or more waveguides are to be formed.

92. (Added) The method of claim 91, wherein the mask is an oxide mask.

93. (Added) The method of claim 91, wherein the mask is a photoresist.

94. (Added) The method of claim 27, wherein the etching medium is applied in an inductively coupled plasma etch.

95. (Added) The method of claim 27, wherein the etching medium consists of SF_6, CHF_3 and Oxygen.